CLAIMS

What is claimed is:

1. A method of efficiently using bandwidth for contention based access and ranging in a time-synchronized communication system, wherein the communication system comprises at least one base station and at least two subscriber units, the method comprising the steps of:

(a) waiting for a new access opportunity;

(b) scanning for an access burst message from a subscriber unit;

(c) acquiring the access burst message from a subscriber unit;

(d) sending a Tx delay time data value to the subscriber unit for communication time synchronization; and

(e) returning to step (a) if the new access opportunity has expired, else returning to step (b).

2. A method of efficiently using bandwidth for contention based access and ranging in a time-synchronized communication system, wherein the communication system comprises at least one base station and at least two subscriber units, the method comprising the steps of:

(a) waiting for a new access opportunity;

(b) scanning for an access burst message from a subscriber unit;

(c) acquiring the access burst message from a subscriber unit;

(d) storing a Tx delay time data value for the subscriber unit;

(e) determining whether the new access opportunity has expired; and

(f) sending the Tx delay time data value to the associated subscriber unit for communication time synchronization and returning to step (a) if the new access opportunity has expired, else returning to step (b).

3. The method of efficiently using bandwidth for contention based access and ranging in a communication system of claim 2, wherein the access burst message from the subscriber unit comprises a packet further comprising a send time of the subscriber unit.

4. The method of efficiently using bandwidth for contention based access and ranging in a communication system of claim 2, wherein the access burst message acquired from the subscriber unit comprises a packet including an identification data associated with the subscriber unit.

5. The method of efficiently using bandwidth for contention based access and ranging in a communication system of claim 2, wherein the communication system is a broadband wireless communication system.

6. The method of efficiently using bandwidth for contention based access and ranging in a communication system of claim 2, wherein the communication system is a cable modem communication system.

7. The method of efficiently using bandwidth for contention based access and ranging in

a communication system of claim 2, wherein the communication system is a satellite communication system.

8. The method of efficiently using bandwidth for contention based access and ranging in a communication system of claim 2, wherein the communication system is a cellular telephone communication system.

9. An apparatus for contention based access and ranging in a time-synchronized communication system, wherein the communication system comprises at least one base station and at least two subscriber units, comprising:

(a) means for detecting an occurrence of a new access opportunity;

(b) means for scanning for an access burst message from a subscriber unit;

(c) means for acquiring the access burst message from a subscriber unit; and

(d) means for sending a Tx delay time data value to the subscriber unit for communication time synchronization.

10. The apparatus as set forth in Claim 9, wherein the access burst message obtained from the subscriber unit comprises a packet including a send time associated with the subscriber unit.

11. The apparatus as set forth in Claim 9, wherein the access burst message obtained from the subscriber unit comprises a packet including identification data associated with the subscriber unit.

12. The apparatus as set forth in Claim 9, wherein the communication system is a broadband wireless communication system.

13. The apparatus as set forth in Claim 9, wherein the communication system is a cable modem communication system.

14. The apparatus as set forth in Claim 9, wherein the communication system is a satellite communication system.

15. The apparatus as set forth in Claim 9, wherein the communication system is a cellular phone communication system.